SOKOL'SKAYA, A.V., EL'PINER, I.Ye.

Fixation of molecular nitrogen under the influecne of ultrasonic waves with the formation of biologically important substances. Akust. zhur. 6 no.2:263-264 '60. (MIRA 13:8)

1. Institut biofiziki AN SSSR, Moskva.
(Nitrogen--Fixation) (Ultrasonic waves)

EL'PINER, I.Ye.; SOKOL'SKAYA, A.V.

Amino acid synthesis in aqueous solutions of organic compounds saturated with molecular nitrogen due to the effect of ultrasonic waves. Dokl.AN SSSR 133 no.5:1227-1230 Ag '60. (MIRA 13:8)

1. Institut biologicheskoy fiziki Akademii nauk SSSR. Predstavleno akad. A.I. Oparinym.
(Amino acids) (Ultrasonic waves)

SOKOLSKAYA, A. V., ELPINER, I. Ye. (USSR)

"Synthesis of Amino Acids under the Influence of Ultrasonic Waves."

Report presented to the 5th International Biochemical Congress, Moscow, 10-16 August 1961

EL'PINER, I.Ye.; SOKOL'SKAYA, A.V.

Inert gases and amino acid synthesis in the field of ultrasonic waves. Dokl. AN SSSR 140 no.2:496-498 S '61. (MIRA 14:9)

1. Institut biologicheskoy fiziki AN SSSR. Predstavleno akademikom A.I.Oparinym.
(Amino acids) (Ultrasonic waves) (Argon)

EL'PINER, I.Ye.; SOKOL'SKAYA, A.V.

Chemical transformations of dipeptides and tripeptides under the action of ultrasonic waves in the presence of active and inert gases. Dokl. AN SSSR 147 no.5:1220-1222 D '62. (MIRA 16:2)

1. Institut biologicheskoy fiziki AN SSSR. Predstavleno akademikom A.I. Oparinym.
(PEPTIDES) (ULTRASONIC WAVES)

SOKOL'SKAYA, A.V.; EL'PINER, I.Ye.

Formation of fluorescent substances under the action of ultrasonic waves on cytosine. Akust. zhur. 9 no.1:126-128 '63. (MIRA 16:5)

1. Institut biofiziki AN SSSR, Moskva.
(Cytosine) (Ultrasonic waves) (Fluorescence)

EL'PINER, I.Ye.; SOKOL'SKAYA, A.V.

Physicochemical transformations of pyrimidine and purine bases in a field of ultrasonic waves with the formation of a series of fluorescent substances. Dokl. AN SSSR 153 no.1: 200-203 N '63. (MIRA 17:1)

1. Institut biologicheskoy fiziki AN SSSR. Predstavleno akademikom A.I. Oparinym.

L 6886-65 EWT(m)/EPF(c)/EPR/EWP(j)/EWP(q)/EWP(b) Pc-4/Pr-4/Ps-4/Pa-4 IJP(c)/
RPL JD/WW/RM

ACCESSION NR: AP4044622 S/0046/64/010/003/0370/0372

69
68

AUTHORS: Margulis, M. A.; Sokol'skaya, A. V.; El'piner, I. Ye.

TITLE: Chain reaction sensitized by bromine and induced by ultrasound waves

SOURCE: Akusticheskiy zhurnal, v. 10, no. 3, 1964, 370-372

TOPIC TAGS: ultrasound irradiation, chain reaction, maleic acid, fumaric acid, ethylene

ABSTRACT: It is shown that under the influence of ultrasonic waves it is possible to induce reactions that are characterized by a large quantum yield and a high percentage of chemical transformation of the initial material. This applies to the process of stereoisomerization of compounds of the ethylene series (ethylene-1, 2-dicarboxylic acid), induced by ultrasonic waves. The conversion of maleic into fumaric acid, induced by ultrasonic waves, can be easily

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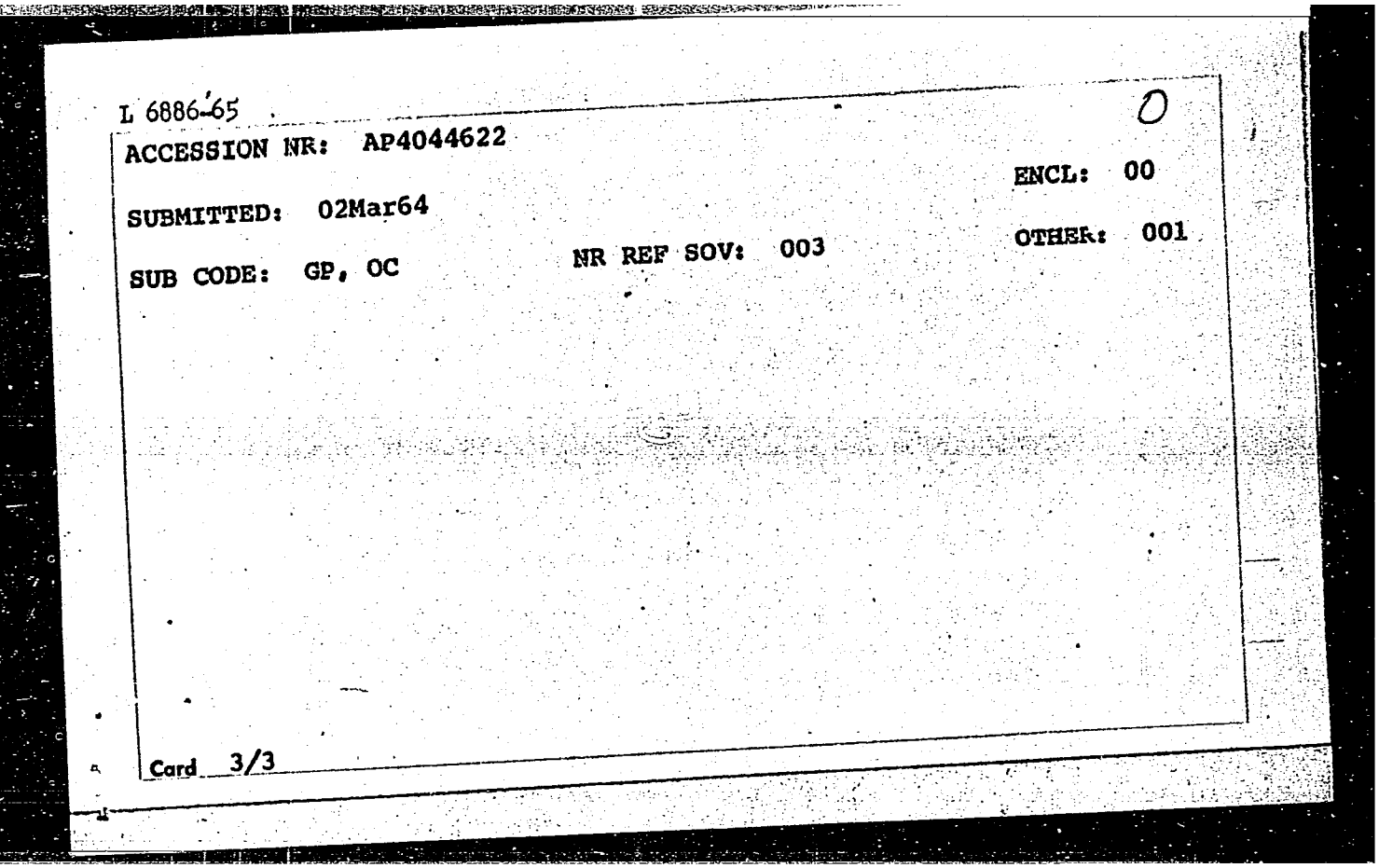
observed because the resultant fumaric acid has a much lower solubility in an aqueous medium than maleic acid. In these experiments, the conversion of maleic acid into fumaric acid was produced not by ultraviolet irradiation with bromine as a catalyst, but by application of an ultrasonic field (20, 600, and 840 kcs, and 1 and 2.5 Mcs) and that the reaction can be effected in darkness if the aqueous solution of the maleic acid is saturated with argon, helium, hydrogen, or nitrogen. The amount of produced fumaric acid depended on the nature of the saturating gas. An explanation is proposed for the mechanism of the chain reaction in the ultrasonic field, and it is suggested that the excitation of the bromine atoms, initiating the investigated reaction, occurs in a cavitational void. Orig. art. has: 3 formulas and 1 table.

ASSOCIATION: Institut biofiziki AN SSSR, Moscow (Institute of Biophysics AN SSSR)



L 6886-65 0

ACCESSION NR: AP4044622

ENCL: 00

SUBMITTED: 02Mar64

SUB CODE: GP, OC NR REF SOV: 003 OTHER: 001

Card 3/3

KHMARSKIY, N.Z.; KUCHERENKO, M.T.; SOKOL'SKAYA, A.V.; TANATAR-BARASH, Z.I.

Lithological and facies characteristics of coal deposits in the western extension of the Donets Basin. Trudy Lab.geol.ugl. no.5: 249-258 '56. (MLRA 9:8)

1. Dnepropetrovskiy gosudarstvennyy universitet.
(Donets Basin--Coal geology)

11-5-7/15

SUBJECT: USSR/Geology

AUTHOR: Sokol'skaya, A.V. and Tanatar-Barash, Z.I.

TITLE: Limestones of Upper-Wisean Sediments of the Lower-Carbon in the Western Extension of the Donbass (Izvestnyaki verkhnevizeyskikh otlozheniy nizhnego Karbona zapadnogo prodolzheniya Donbassa)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Geologicheskaya, 1957, # 5, pp 80-91 (USSR)

ABSTRACT: Carbonate layers in the Upper-Wisean sediments of the Lower Carbon in the western Donbass extension are represented by limestones, dolomites, calcareous argillites, siltstones and sandstones.

By their structural peculiarities and by the character of organic residues the following groups of limestones are distinguished:

1. Organogenous-clastic limestones,
2. fine-grained pelitomorphic limestones,
3. dolomitized limestones, and

TITLE: Limestones of Upper-Wisean Sediments of the Lower-Carbon in the Western Extension of the Donbass (Izvestnyaki verkhnevizeyskikh otlozheniy nizhnego Karbona zapadnogo prodolzheniya Donbassa)

4. Argillaceous limestones and calcareous argillites.

Organogenous-clastic limestones are the most widespread group of rocks among the carbonate sediments of the Upper-Wise period. These rocks are characterized by considerable content of organism fragments and entire shells.

Fine-grained pelitomorphic limestones are of no independent importance and occur among the other types in interstratification.

Dolomitized limestones are characteristic mainly for the sediments of the Turneyskiy formation. They are composed of calcite and dolomite.

Argillaceous limestones and calcareous argillites form individual inter-layers among the limestones. They are heterogeneous and are composed of calcite, ankerite, dolomite and and siderite.

11-5-7/15

TITLE: Limestones of Upper-Wisean Sediments of the Lower-Carbon in the Western Extension of the Donbass (Izvestnyaki verkhnevizeyskikh otlozheniy nizhnego Karbona zapadnogo prodolzheniya Donbassa)

On the basis of detailed lithological studies of carboniferous sediments the authors distinguish several genetic types of carbonate rocks:

1. Most deep-water formations are carbonate layers composed mainly of calcite and containing insignificant amounts of insoluble residues. Organic residues are represented by foraminiferas and algae (limestones B_1, B_2, B_5, B_6, B_7);

2. More shallow formations are limestones with mixed fauna and contain a high admixture of terrigenous material. The main carbonate mass is represented by calcite and ankerite (limestones B_3, B_4, C_1, C_6, D_1);

3. Most shallow formations are crinoid limestones with a high content of terrigenous material. The carbonate mass is represented by ankerite, oligonite and pistomesite.

Card 3/4 Different genetic types of carbonate rocks are associated

11-5-7/15

TITLE: Limestones of Upper-Wisean Sediments of the Lower-Carbon in the Western Extension of the Donbass (Izvestnyaki verkhnevizeyskikh otlozheniy nizhnego Karbona zapadnogo prodolzheniya Donbassa)

with definite stratigraphic layers. Detailed data characteristic for each of the stratigraphic layers are compiled in a table enclosed in the article.

The article contains 1 figure and 1 table.

There are 4 references, all Slavic.

ASSOCIATION: Dnepropetrovsk State University

PRESENTED BY:

SUBMITTED: On 9 July 1956

AVAILABLE: At the Library of Congress

Card 4/4

AUTHOR: SOKOL'SKAYA, A.V., KHMARSKIY, N.Z. PA - 3173

TITLE: On Alluvial Deposits in the Lower Carboniferous of the Western Parts of the Donets Basin. (Ob allyuvial'nykh otlozheniyakh v nizhnem karbone zapadnykh rayonov Donbassa, Russian)

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol 113, Nr 3, pp 664-666 (U.S.S.R.)

ABSTRACT: A short survey is given on the data of the determination of alluvial formations in the lower carboniferous formations in the region of Petropawlowsk-Pawlograd, the SW continuation of the Donez basin. Investigations were based on the lithologo-facial method. The material investigated was a sample obtained by wildcat drilling. As a result of investigations it may be said that at the time of the formation of carboniferous layers the more remote parts of the shore were in the North and NE, whereas in the South and SW were the more shallow parts of the coast. Behind this coast was the continent which was the main source of detritus. Therefore, rivers at that time flowed from South and SW towards North and NE. (2 Illustrations and 4 Slavic References).

ASSOCIATION: State University of Dnepropetrowsk
PRESENTED BY: N.M. STRAKHOV, Member of the Academy, on 25.10.1956
SUBMITTED: 20.4.1956
AVAILABLE: Library of Congress

Card 1/1

KUCHERENKO, M.T.; SOKOL'SKAYA, A.V. [Sokol's'ka, A.V.]

Certain peculiarities of sediment and coal accumulation in the Carboniferous of the western Donets Basin [with summary in English]. Dop. AN URSR no. 4:434-436 '58. (MIRA 11:8)

1. Dnipropetrovs'kiy derzhavniy universitet. Predstaviv akademik AN URSR V.H.Bondarchuk [V.G.Bondarchuk].
(Donets Basin--Geology, Stratigraphic)

KUCHERENKO, M.T.; SOKOL'SKAYA, A.V. [Sokol's'ka, A.V.]

Conditions of the accumulation of sediments and stratigraphic extent of layers underlying the coal bearing strata of the lower Carboniferous in the western extension of the Donets Basin [with summary in English]. Dop.AN URSR no.12:1345-1348 '58. (MIRA 12:1)

1. Nauchno-issledovatel'skiy geologicheskiy institut Dnepropetrovskogo gosudarstvennogo universiteta. Predstavil akademik AN USSR V.G.Bondarchuk [V.H.Bondarchuk]
(Donets Basin--Geology, Stratigraphic)

AUTHORS: Kucherenko, M. T., Sokol'skaya, A. V. 20-119-1-44/60

TITLE: On Several Problems of the Stratigraphy of the Carbonate Stratum in the Lower Carboniferous of the Northern Slope of the Ukrainian Crystalline Massif (O nekotorykh voprosakh stratigrafii karbonatnoy tolshchi nizhnego karbona severnogo sklona Ukrainskogo kristallicheskogo massiva)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol 119, Nr 2, pp 347- 350 (USSR)

ABSTRACT: The Tournaisian and Lower Visean sediments were traced in the mentioned region far westward to the vicinity of the town of Novo-Moskovsk. Numerous scientists (References 1-10) came to the conclusion that the former and the majority of the latter carbonate sediments to the west markedly diminish in thickness, are replaced by terrigenous deposits and near Novo-Moskovsk entirely thin out. According to other authors (Reference 2,11) there is no facies substitution of the carbonate deposits by terrigenous ones in the region under consideration. These contradictions can be explained by the absence of detailed lithologic characteristics

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On Several Problems of the Stratigraphy of the Carbonate Stratum in the Lower Carboniferous of the Northern Slope of the Ukrainian Crystalline Massif

of these rocks. Therefore the authors give such characteristics for the Donetskiy basin and confirm the participation of Tournaisian and Lower Visean sedimentary complexes in the structure of the southern parts of the Donetskiy basin and of the northern slope of the Ukrainian massif. The Tournaisian transgression here began by sedimentation of arenaceo- loamy rocks turning over to microgranular limestones with interstratifications of argillites of the $C_1^t a$-zone. This took place in a shallow bay which extended from south Donbass to the village Alefirovka in a westerly direction. Gradually the bay expanded and during the sedimentation of the $C_1^t b$ -zone reached Novomoskovsk. This transgression reached its maximum during the sedimentation of the organogenous limestones of the zone $C_1^t c$. These are distributed as far as the village Kulebovka. The then occuring retrogression

On Several Problems of the Stratigraphy of the Carbonate Stratum in the Lower Carboniferous of the Northern Slope of the Ukrainian Crystalline Massif

of the Tournaisian sea found its expression in the expansion of the zone $C_1^t d$ only in southern districts of the Donbass (Reference 4). The Visean-period began by a new, more extensive transgression which expanded along the northern edge of the massif as far as the village Podgorodneye. In the east the foraminiferae-algae-limestones of the zone $C_1^v a$ are deposited on shallow-water sediments of the zone $C_1^t d$ near Pavlograd they are deposited on the decomposed surface of the same zone, west of Kulebovka on the weathered crust of Pre-Cambrian rocks. The then existing sea had a normal degree of salinity and a normal hydrodynamical regime. The most shallow parts were in the farthest west. Chemogenic limestones with terrigenous admixtures were deposited there. Limestones with content of silica and silicate rocks of the zone $C_1^v d$

On Several Problems of the Stratigraphy of the Carbonate Stratum in the Lower Carboniferous of the Northern Slope of the Ukrainian Crystalline Massif

are deposits of the recessing Lower Visean sea, which is gradually becoming more shallow. Its border moved into the district of Pavlograd. During the sedimentation of the zone $C_1^v f$ the sea receded further, that is, as far as Novo-Pavlovka. After the recession of the sea there remained a subdued swampy plane, which was covered by vegetation and in many places showed peat formation. To the west there was no substitution of the limestones of the $C_1^v f$ zone, as the references 1-10 are maintaining. In the course of the sedimentation of the carbonate stratum mentioned in the title apart a general depression slow fluctuating movements took place by which abysmal sediments were relieved by sediments of the shallower water. There could hardly have been a deviating tectonic regime at the northern slope of the massif and in the adjacent regions at the time of the sedimentation of the zone $C_1^v f$. It is more likely that the rhythmic fluctuations occured at

On Several Problems of the Stratigraphy of the Carbonate Stratum in the Lower Carboniferous of the Northern Slope of the Ukrainian Crystalline Massif

the same time in the whole Donbass and its western areas. There are 17 references, all of which are Soviet.

ASSOCIATION: Dnepropetrovskiy gosudarstvennyy universitet (Dnepropetrovsk State University)

PRESENTED: December 27,1957, by D. V. Nalivkin, Member, Academy of Sciences, USSR

SUBMITTED: April 1, 1957

Card 5/5

5(3) SOV/11-59-5-4/14

AUTHOR: Kucherenko, M.F. and Sokol'skaya, A.V.

TITLE: Lithologic-Facial Characteristics of the Carboniferous Stratum of the Lower Carboniferous Period at the Northern Slope of the Ukrainian Crystalline Massif. (Litologo-fatsial'naya kharakteristika karbonatnoy tolshchi Nizhnego Karbona severnogo sklona Ukrainskogo kristallicheskogo massiva.)

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya geologicheskaya, 1959, Nr 5, pp 49-59 (USSR)

ABSTRACT: The authors give a detailed description of the Tournaisian and Lower-Visean deposits of the northern slope of the Ukrainian crystalline massif, which were uncovered during the prospecting operations of the Trest Artemgeologiya (the Artemugleologiya Trust), Trest Okruglegeologiya (the Okruglegeologiya Trust) and the Ukrainskoye geolo-

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Lithologic-Facial Characteristics of the Carbonaceous Stratum of the Lower Carboniferous Period at the Northern Slope of the Ukrainian Crystalline Massif.

gicheskoye upravleniye (the Ukrainian Geological Administration). Geologists who studied the stratigraphic structure of this region were divided as to its lithologic and facial features. Some of them believed that the Tournaisian and Lower-Visean strata sharply decreased in width in a westernly direction and tapered altogether. The authors, on the contrary, believe that the southern part of the Donbass and the northern slopes of the Ukrainian crystalline massif are covered with carbonaceous series of deposits divided into a Tournaisian and Lower-Visean strata. The sedimentation conditions, however, were very different for various parts of the region. Some of them occured in conditions of deep transgressing Tournaisian sea with luxuriant fauna. Others

SOV/11-59-3-[illegible]/14

Lithologic-Facial Characteristics of the Carbonaceous Stratum of the Lower Carboniferous Deposited at the Northern Slope of the Ukrainian Crystalline Massif.

occurred under the coastal conditions of a shallow sea with considerable inclusion of terrigenous material brought by the continental rivers. Organogenous sedimentation occurred mainly in eastern part of the massif where the fauna was very rich, whereas this process was replaced in the western part of this massif by a chemical sedimentation of $CaCO_3$, caused by the afflux of a terrigenous material unfavorable for the development of living organisms. This resulted in a substantial difference, in the composition of various sandstones, argyllites and limestones which form both strata. The following geologists are mentioned by the authors: D.Ye. Ayzenverg, M.Ye. Brazhnikova, N.T. [illegible]-Yartsova, [illegible] Dyssa, [illegible] Nesterenko, [illegible] [illegible]dina, [illegible] Shirokov, S.V. Trofimov, [illegible], [illegible].

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SOV/11-5[illegible]-5-4/14

Lithologic-Facial Characteristics of the Carbonaceous Stratum of the Lower Carboniferous Period at the Northern Slope of the [illegible] Massif.

Stovpovoy, [illegible], [illegible], [illegible], [illegible] [illegible], A.F. Shlyan, and [illegible]. There are 1[illegible] Soviet references.

ASSOCIATION: N.-i.geologicheskiy institut Dnepropetrovskogo gosudarstvennogo universiteta (the Scientific Research Institute of the Dnepropetrovsk State University)

SUBMITTED: July 24 1957

Card 4/4

KUCHERENKO, M.T.; SOKOL'SKAYA, A.V. [Sokol's'ka, A.V.]

Characteristics of carbonate concretions in upper Visean deposits of the western regions of the Donets Basin. Dop. AN URSR no.12: 1614-1617 '61. (MIRA 16:11)

1. Dnepropetrovskiy gosudarstvennyy universitet. Predstavleno akademikom AN UkrSSR V.G. Bondarchukom [Bondarchuk, V.H.].

KUCHERENKO, M.T.; SOKOL'SKAYA, A.V.

Lithofacies characteristics of sediments of the $B(C^2_1)$ series in the lower Carboniferous of the northern slope of the Ukrainian Crystalline Massif. Izv.vys.ucheb.zav.; geol. i razv. 4 no.11: 13-20 N '61. (MIRA 15:2)

1. Dnepropetrovskiy gosudarstvennyy universitet.
(Dnieper Valley—Coal geology)

KUCHERENKO, M.T.; SOKOL'SKAYA, A.V. [Sokol's'ka, A.V.]

Lithological facies characteristics of deposits of the C zone in western regions of the Donets Basin. Dop. AN URSR no.2:233-236 '62. (MIRA 15:2)

1. Dnepropetrovskiy gosudarstvennyy universitet. Predstavleno akademikom AN USSR V.G.Bondarchukom [Bondarchuk, V.H.].
(Donets Basin—Geology, Stratigraphic)

SOKOL'SKAYA, B. P.

Cand. Agricultural Sci. Mbr., Ivanovo Oblast Experimental Farming Sta., -c1948-c49-. "The Influence of 2, 4-Dichlorophenoxy Acetic Acid on the Formation of Seeds in Clover," Dok. AN, 59, No. 3, 1948; "Some Biological Characteristics of Red Clover," Agrobiol., 4, 1949.

SOKOL'SKAYA, M?P?

Clover; Lime; Timothy Grass

Influence of small doese of lime on yield of clover and timothy-grass. Agrobiologiia no. 2:113-117 Mr-Ap '52.

Kandidat L.-Kh Nauk Ivanovskaya Oblastnaya Stantsiya Zemledeliya Opytnaya

SO: Monthly List of Russian Accessions, Library of Congress, July 1952 1953, Uncl.

SOKOL'SKAYA, B.P.

Clover

Protection of red clover by means of early ulling. Agrobiologiia no. 2:117-119 Mr-Ap 1952. Kandidat S.-Kh Nauk Ivanovskaya Oblastnaya Opytnaya Stansiya Zemledeliya

SO: Monthly List of Russian Accessions, Library of Congress, July 1952 1953, Uncl.

[redacted], T. .

Clover

Cutting seed plants of late-maturing clover. Korm. baza 3 No. 5, 1952.

9. MONTHLY LIST OF RUSSIAN ACCESSIONS, Library of Congress, September 1952. Uncl.

SOKOL'SKAYA, B. P.

Clover

Determining types of red clover.
Sel. i sem. 19, no. 5:70-72 My 1952.

9. Monthly List of Russian Accessions, Library of Congress, July 1952. UNCLASSIFIED.

COUNTRY : USSR
CATEGORY : Cultivated Plants. Fodder Grasses and Roots.
M

ABS. JOUR. : RZhBiol., No. 1, 1959, No. 1799

AUTHOR : [illegible], B.I.
INST. : Ivanov Experimental Station
TITLE : Early Approbation of Red Clover.

ORIG. PUB. : [illegible] i [illegible], 1958, No. 5, 37-38

ABSTRACT : Described is a worked out approbation method by the Ivanov experimental station for [illegible] ripening clover according to plant development and by way of morphological analysis of the vegetative cone. In southern types of clover, flowers are formed on 5-6 inter-nodes and in northern types on 8-9 inter-nodes. Under approach at the beginning of July of southern types of clovers, in the top part of the stem a [illegible] is easily developed which is absent in late-ripening

CARD: 1/2

SOKOL'SKAYA, R.P., kand.sel'skokhozyaystvennykh nauk

Biological and economic features of cross-pollinated red clover. Agrobiologiia no.4:63-67 Jl-Ag '58. (MIRA 11:9)

1. Ivanovskaya gosudarstvennaya sel'skokhozyaystvennaya opytnaya stantsiya.
(Red clover) (Fertilization of plants)

SOKOL'SKAYA, E.

Leading brigade of the Krasnopresnenskiy Sugar Refinery. Sakh.prom. 35 no.3:10-11 Mr '61. (MIRA 14:3)
(Moscow--Sugar industry)

SOKOL'SKAYA, E.

At the All-Union Exhibition of the Achievements of the U.S.S.R. in 1961 "Sugar and confectionery industry" section. Sakh. prom. 35 no.6:10-12 Je '61. (MIRA 14:6)
(Sugar industry--Exhibitions)

SOKOL'SKAYA, E.

"Sakharnaia svekla" is an active advertiser of beet growing. (MIRA 14:7)
Sakh.prom. 35 no.7:77-78 Jl '61.
(Sugar beets)

SOKOL'SKAYA, E. V.

Conference and seminar of the representatives of the R.S.F.S.R. sugar industry. Sakh. prom. 36 no.10:78-79 O '62. (MIRA 15:10)

(Sugar industry)

SOKOL'SKAYA, E.V.

Was the State Institute for the Design and Planning of Sugar factories right in its decision? Sakh.prom. 37 no.2:70(150)-71(151) F '63. (MIRA 16:5)
(Odessa--Sugar industry--Technological innovations)

SOKOL'SKAYA, E.V.

Conference of the readers of the journal "Sakharnaia promyshlennost." (MIRA 16:8)
Sakh. prom. 37 no.8:73-74 Ag '63.

(Sugar industry--Periodicals)

STEPANOV, Leonid Grigor'yevich; SOKOL'SKAYA, E.V., red.; LYUDKOVSKAYA, N.I., tekhn. red.

[Guard a woman's health; contraceptive methods] Beregite zdorov'e zhenshchiny; o sredstvakh preduprezhdaiushchikh beremennost'. Moskva, Gos. izd-vo med. lit-ry Medgiz, 1960. 9 p. (MIRA 14:9)
(CONCEPTION—PREVENTION)

LATSINIK, Ye.Ya., prof.; SLOVESNIK, R.S.; SOKOL'SKAYA, G.T.; KALINA, O.S.
(Odessa)

Mistakes in the diagnosis of Botkin's disease and of obstructive jaundice. Vrach.delo no.1:65-69 '60. (MIRA 13:6)

1. Gorodskaya infektsionnaya bol'nitsa.
(HEPATITIS, INFECTIOUS) (JAUNDICE)

SOKOL'SKAYA, I. A.

Use of urosulfane in treatment of inflammatory diseases of the urinary tract. Sovet. med. No. 12, Dec. 50. p. 9-11

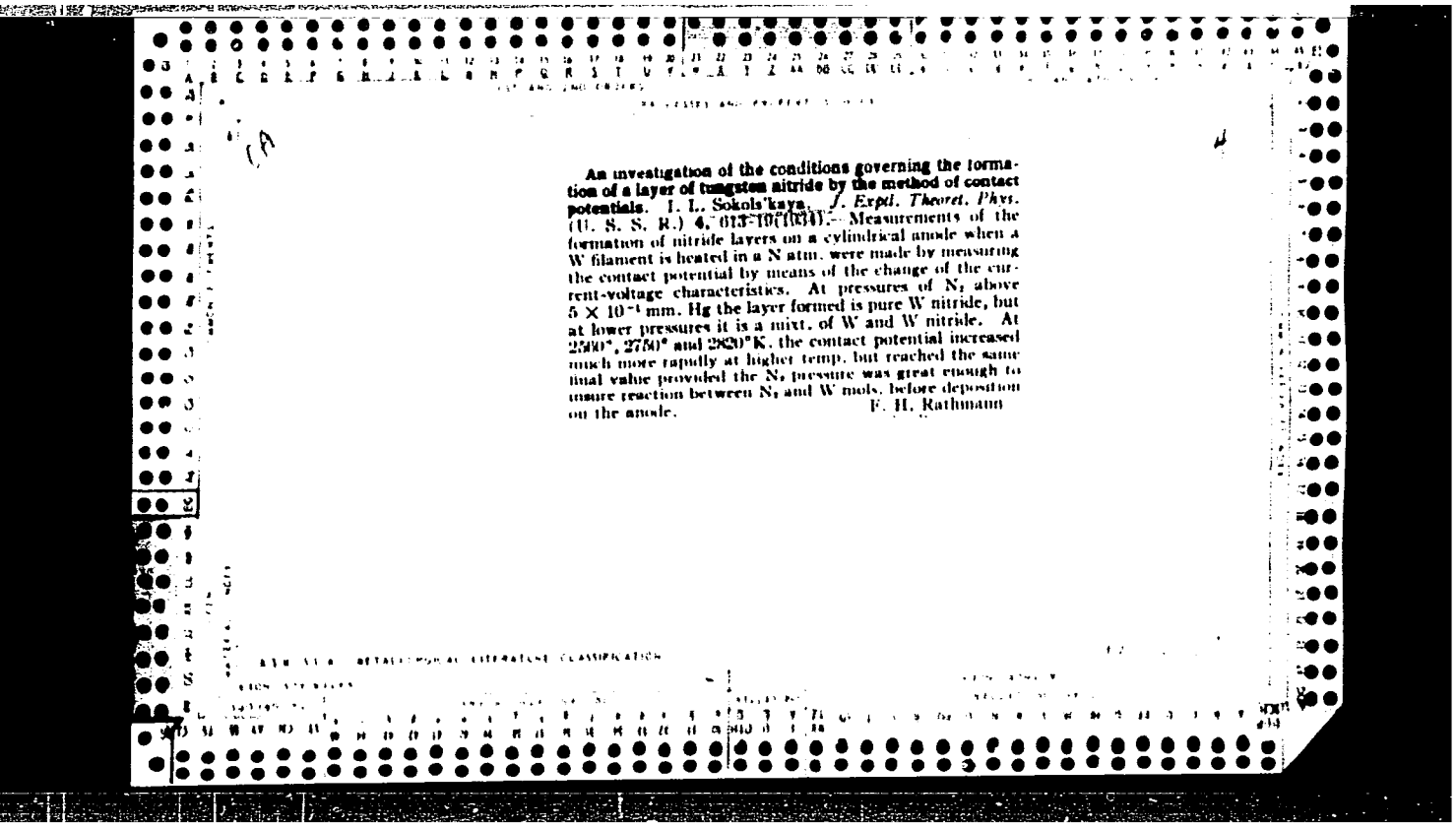
1. Of the Urological Clinic of the Central Institute for the Advanced Training attached to the Hospital imeni S. P. Botkin (Head of Clinic -- Prof. A. P. Frumkin), Moscow.

CIML 20, 3, March 1951

VOLKOV, A.M.; SOKOL'SKAYA, I.D.

New technological processes for preparing surgical apparatus and instruments. Trudy NIIEKHAI no.5:317-323 '61. (MIRA 15:8)

1. Nauchno-issledovatel'skiy institut eksperimental'noy khirurgicheskoy zpparatury i instrumentov.
(SURGICAL INSTRUMENTS AND APPARATUS)



An investigation of the conditions governing the formation of a layer of tungsten nitride by the method of contact potentials. I. L. Sokols'kaya. *J. Expil. Theoret. Phys.* (U. S. S. R.) 4, 613-19(1934).— Measurements of the formation of nitride layers on a cylindrical anode when a W filament is heated in a N atm. were made by measuring the contact potential by means of the change of the current-voltage characteristics. At pressures of N_2 above 5×10^{-4} mm. Hg the layer formed is pure W nitride, but at lower pressures it is a mixt. of W and W nitride. At 2500°, 2750° and 2820°K. the contact potential increased much more rapidly at higher temp. but reached the same final value provided the N_2 pressure was great enough to insure reaction between N_2 and W mols. before deposition on the anode. F. H. Rathmann

Thermoelectronic emission of tungsten covered with platinum. M. D. Kruglova and I. L. Sokol'skaya (Leningrad State Univ.). *Zhur. Tekh. Fiz.* 19, 1292–308 (1949).—Since the value of the work function φ is 5.32 e.v. for Pt and about 4.5 e.v. for W, adsorption of Pt on W could be expected to lower the intensity i of the thermoelectronic emission and to increase φ. Expts. were made with a Pt wire parallel to a W wire, and various amts. of Pt were evapd. onto the W under a pressure of 10^{-6} mm. or less. At const. temp. of the Pt wire (1650, 1710, and 1770°K.), i of the W wire decreases with the time of the evapn., first rapidly, then more slowly, and reaches a low limit approx. the same for all 3 temps. The fall of i is faster, and the limit is reached sooner, the higher the temp. At the limit, the no. of Pt atoms adsorbed on the W wire is approx. 5.8×10^{14} atoms sq. cm. The total fall of i from pure W to that covered with Pt is by a factor of approx. 70; as only one side of the W wire faces the Pt wire, this fall of i demonstrates free migration of Pt atoms over the surface of the W wire. Rectilinear Richardson plots, $\log (i/T^2)$ vs. $(1/T)$, between 1600 and 1800°K., give for different coverages (θ = 0, 0.3, 0.67, 0.98) φ = 4.35–4.05 e.v. The explanation is that the coverage is nonuniform, and only the bare surface area S_b is responsible for the emission, whereas the covered part of the surface S_c has too high a work function to emit. If so, $\theta = S_c/S$, where S = total surface area, and $\theta = 1 - (S_b/S) = 1 - (i/i_W)$, where i_W refers to the emission of pure W. The increase of i with time, at const. temp., must be proportional to the increase of S_b, i.e. to the evapn. of Pt from the W wire. Consequently, expti. curves of i as a function of time represent curves of evapn. of Pt at a given temp. These curves differ in both shape and scale from the time curves of deposition of Pt on the W wire; at the same temp. desorption of a Pt layer which had been produced within 1 min. requires several hrs. The heat of evapn. (λ) of Pt from a W surface is calcd. by equating the rate of evapn. of Pt atoms $dn/dt = d(i/i_W)/dt$ to the no. of atoms $pS_c/\sqrt{2\pi mkT}$ impinging on the surface per sec., and using the Clausius-Clapeyron equation for the vapor pressure with λ in erg/atom. This gives $(S/S_b)\,(di/i_W dt) = Ce^{-\lambda/kT}/\sqrt{2\pi mkT}$ and, on the assumptions that λ is approx. independent of temp., and that the variation of T^2/i is very slow as compared with the exponential, $\log y = \log [(d\theta/dt)/\theta] = -(\lambda/kT) \log e + B$, permitting detn. of λ from the slope of $\log y = f(1/T)$. The variation of λ with θ is slight, $d\lambda/d\theta$ not exceeding 10 kcal./mole between θ = 0.8 and 0.3. At θ = 0.8, λ = 207 ± 25 kcal./mole, i.e. as expected much greater than for compact Pt (128 kcal./mole). In terms of the elec. field strength E at the surface, deviations from the Schottky law of linearity between $\log i$ and $\sqrt{E}$ due to local fields detd. by the dimensions of the inhomogeneities of the surface and the local contact potentials, occur at lower E, approx. from $E \sim 1000$ v. 1 cm. down. In platinized W the local fields are much weaker than in thoriated W, where compensation is attained only at E = 3500–5000 v./cm. The deviation from Schottky's law in platinized W increases with θ. In Th/W the electrons are emitted by the covered part of the surface; in Pt/W, by the bare fraction. From the slopes of Richardson plots at different E values, the work function above E = 1000 v./cm. is const. and equal to φ of pure W. Further decrease of E is accompanied by an increase of φ, e.g., at E = 750, φ = 5.0, and at E = 500, φ = 5.4 e.v. At the same E, but much higher coverage, φ attains 6 e.v., which is higher than the value of Whitney (*C.A.* 31, 2085[1]) for Pt. N. Thon

CA

Investigation of the field emission of a monocrystalline needle point by means of a spherical electronic projector. I. L. Sokol'skaya (Leningrad State Univ.). *Izvest. Akad. Nauk S.S.S.R., Ser. Fiz.*, 15, 472-3(1951).—W and thoriated W needles with points sharper than 1 μ are mounted in spherical bulbs ½ of which is covered inside with a Willemite screen and the other is made conductive. If a voltage up to + 3000 v. is applied to this conductive strip, magnifications of the needle point of 2×10^6 can be observed on the screen.

Emission pictures of the needles heated in vacuo to 1300–1600°K. with or without application of an elec. field of 10^7–10^8 v. cm.$^{-1}$ show that the adsorbed atoms of Th migrate on the surface to positions of lowest free energy, quite different from the spherical symmetric picture obtained from a needle heated without elec. field S. Paksweer

SOKOLSKAYA, I. L.

546.817.221 : 621.314.63 1343

The Rectifying Properties of Lead Sulphide. I. I. Adrianova and I. L. Sokol'skaya. (*Zh. tekh. Fiz.*, June 1951, Vol. 21, No. 6, pp. 713-714.) According to modern theory, contact rectification takes place when the metal is positive with respect to the semiconductor. Experiments with PbS and a tungsten point indicated that if the applied voltage is increased up to 1-1.5 V the rectified current changes its direction. Also, if the rectifying contact is placed in vacuum, the current decreases and then changes its sign. An explanation of the phenomena is advanced.

PA 253T111

SOKOL'SKAYA, I. L.

USSR/Physics - Ionization Dec 52

"Investigating the Surface Ionization of Sodium on Platinized Wolfram," Kim Khen Bon /Kim Heng-pong?/ and I. L. Sokol'skaya

Vest Leningrad U, Ser Mat, Fiz, Khim, No 12, pp 67-79

An investigation into hitherto unstudied ionization of complex surfaces with electrically negative layers (the case of positive layers has been thoroughly studied), the object of study chosen being a Pt layer dusted on W, which is one of the few metal layers negative relative to W. Present

253T111

the temp dependence of ion emission from the surface of platinized W in Na vapors, and dependence of ionic current from pure and platinized W upon external field. Thank Acad A. A. Lebedev, supervisor of their chair, for his suggestions.

253T111

USSR/Physics - Electron Emission Aug 52

"Investigation of Self-Electron Emission From a Single Crystal Edge by Means of a Spherical Electron Projector," I. L. Sokolskaya; Physical Inst of the Leningrad Order of Lenin State U imeni Zhdanov

"Zhur Tekh Fiz" Vol 22, No 8, pp 1301-1304

Visual observation by means of an electron microprojector revealed that after heating in vacuum the edge takes a semispherical shape due to surface tensions. But the equil shape of a single

226T95

crystal should not be spherical, the article states. Expts by the authoress showed a multifaced structure of the edge. Indebted to Acad A. A. Lebedev. Received 7 Jun 51.

226T95

SOKOLSKAYA, I. L.

SOKOL'SKAYA, I.L.

621.314.632 : 537.311.33

4046. The dependence of capacitance and rectification on frequency of a point contact metal-semiconductor (lead sulphide). D. N. MIRLIN AND I. L. SOKOL'SKAYA. *Zh. tekh. Fiz.*, 23, *No.* 9, 1582–90 (1953) In Russian.

Inversion and non-inversion rectification properties are examined for varying frequencies especially for $f = 1$–10 Mc/s for both mono- and polycrystalline semiconducting specimens of PbS, Ge and others. The thickness of the barrier layer is estimated and the capacitance measured. Results for PbS at 12 Mc/s are tabulated. Several processes are examined which may have an effect on rectification at high frequencies, and their relaxation times estimated. V. V. ZAKHAROV (R)

SOKOL'SKAYA, I. L.

21

Surface migration in an electric field and the bond energy of tungsten atoms. I. L. Sokol'skaya (A. A. Zhdanov State Univ., Leningrad). *Izvest. Akad. Nauk S.S.S.R., Ser. Fiz.* 20, 1151–2(1956).—The velocity of reconstruction of a rounded W point was observed in an electron microscope at pressures less than 10^{-8} mm. as a function of temp. and the elec. field. From the temp. dependence the energy φ_1 of sepn. of 2 nearest neighbors in the W lattice could be calcd. to be 1.6 ± 0.10 e.v. per atom, in good agreement with φ_1 calcd. from heat-of-evapn. data. S. Pakswer

1 3/0

SOKOL'SKAYA, I.L.

Category : USSR/Electronics - Photoeffect. Electron and Ion Emission H-2

Abs Jour : Ref Zhur - Fizika, No 2, 1957, No 4277

Author : Sokol'skaya, I.L.
Title : Surface Migration of Tungsten Atoms in An Electric Field

Orig Pub : Zh. tekhn. fiziki, 1956, 26, No 6, 1177-1184

Abstract : An investigation was made of the processes of the tansition of a tungsten point from a smoothly-rounded form into a faceted form and vice versa. The investigations were carried out in a electron projector at a pressure on the order of 10^{-9} mm mercury. It is shown that the re-forming process is accompanied by a growth in the field-emission current and can be qualitatively characterized by the value of the latter. It is established that the re-forming accelerates with increasing field intensity regardless of its value, making it possible to consider the migrating atoms as dipoles. The temperature dependence of the re-forming time and of the rounding time was investigated, making it possible to determine the values of the activation energy of these processes. Based on the measurements performed, the energy of interaction of the two nearest neighbors in the tungsten lattice was calculated and was shown to be in good agreement with the results obtained by measuring the heat of evaporation.

Card : 1/1

Sokol'skaya, I.L.

USSR/Electricity - Conductors G-4

Abs Jour : Ref Zhur - Fizika, No 1, 1958, 1382

Author : Sokol'skaya, I.L.
Inst :
Title : Intermetallic Alloys of Platinum and Gold with Alkali and Alkali-Earth Metals.

Orig Pub : Zh. tekhn. fiziki, 1957, 27, No 1, 127-129

Abstract : Report of results of certain preliminary experiments on the study of the electric properties of the systems Na-Au, Na-Pt, and Ba-Pt. The system Na-Au was obtained by heating a gold film in sodium vapors. The gold film itself was obtained by evaporation in high vacuum on a glass backing. To obtain Na-Pt compounds, platinum from a platinum wire was evaporated in sodium vapor, and the compound was precipitated on the galss walls of the apparatus. The components of the Ba-Pt system were condensed jointly in vacuum on a heated quartz plate.

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G-4

USSR/Electricity - Conductors

Abs Jour : Ref Zhur - Fizika, No 1, 1958, 1382

On the basis of the measured values of the specific resistance of the films obtained in this manner, of their contact difference of potential, and also of the transparency of the layer, the author concludes that Na-Au is a typical semiconductor with an impurity activation energy ΔE = 0.15 electron volts. The existence of a NaPt and Ba-Pt compound cannot be considered as fully proven in these experiments.

Card 2/2

ZUBENKO, Yu.V.; KLIMIN, A.I.; SOKOL'SKAYA, I.L.

Volt-ampere characteristics of autoelectronic currents from semiconductors. Fiz.tver.tela 1 no.12:1845-1847 D '59. (MIRA 13:5)

1. Leningradskiy gosudarstvennyy universitet im. A.A.Zhdanova.
(Semiconductors) (Field emission)

83003

S/181/60/002/008/022/045
B006/B063

24.2130

AUTHORS: Pavlovskaya, E. D., Sokol'skaya, I. L., Shishkin, Yu. G.

TITLE: Determination of the Activation Energy of the Process of Stabilization of the Work Function of the Gold - Barium System

PERIODICAL: Fizika tverdoga tela, 1960, Vol. 2, No. 8, pp. 1849 - 1850

TEXT: A preceding paper (Ref. 1) has shown that the work function of Au - Ba layers on tungsten backings can be stabilized by heating. This indicated that a metallic Au - Ba compound was formed. The purpose of this work was to estimate the amount of activation energy required for the formation of such a compound. For this purpose the authors devised a special method of measuring the temperature of the tungsten film between 20 and 1000°C. Higher temperatures were measured with an optical pyrometer. The current dependence of the resistance of the tungsten film was determined first, and then its temperature dependence. Fig. 1 shows R(I) and R(T) of this film. From these two curves, T = f(I) was

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Determination of the Activation Energy of the Process of Stabilization of the Work Function of the Gold - Barium System

S/181/60/002/008/022/045
B006/B063

determined for the range 20 - 500°C. Moreover, the authors determined the temperature coefficient of the resistance, and extrapolated the function $\alpha(T)$ up to 1000°C. Thus, it was possible to replace the temperature measurement by a current measurement. Fig. 3 shows the T(I) curves. The measurement of the temperature of the central part of the film was accurate to within ± 5°C. The activation energy was determined in the following way: For each temperature between 300 and 450°C the authors determined the time necessary to stabilize the work function. The stable value was 3.3 ev. Results:

Temperature [°C]	Duration of Heating [min]
300	40
325	20
350	11
375	5.5
400	2.5
450	1.5

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Determination of the Activation Energy of the Process of Stabilization of the Work Function of the Gold - Barium System

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If the rate of stabilization, $1/t$, is an exponential function of temperature, the curve $\log (1/t) = f(10^3/T)$ may be drawn, and the activation energy, E, may be determined from the slope of this straight line (Fig. 3). It was found that $E = 0.6 \pm 0.1$ ev. There are 3 figures, 1 table, and 1 Soviet reference.

IX

ASSOCIATION: Leningradskiy gosudarstvennyy universitet Fizicheskiy fakul'tet (Leningrad State University, Department of Physics)

SUBMITTED: January 3, 1960

Card 3/3

83004

S/181/60/002/008/023/045
B006/B063

24.7700

AUTHORS: Klimin, A. I., Sedykh, B. N., Sokol'skaya, I. L.

TITLE: Some Laws of Autoelectronic Emission From Semiconductors

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 8, pp. 1851 - 1856

TEXT: The use of semiconductors as autoelectronic emitters in microscopes is of particular significance; only recently the autoelectronic emission from certain semiconductors has been successfully realized. In the present paper, the authors publish results of measurements of the autoelectronic current from a germanium emitter as dependent on the voltage applied and the temperature. A very thin single crystal of germanium ($\varrho \sim 8$ ohm.cm) served as a sample whose arrangement in the projector is described. The emission picture was taken and the autoelectronic current was measured at 10^{-7} torr. Prior to each series of measurement, the apparatus was electrically heated for 4-5 hours at 480° - 500°C. Both the autoelectronic current and the brightness of the (unsymmetrical) representation were strongly increased by heating the

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Some Laws of Autoelectronic Emission From Semiconductors

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emitter or by exposing it to infrared light. Emitters of $\varrho \sim 10^{-2}$ ohm.cm did not change with temperature. The autoelectronic current was also measured at different temperatures and voltages, and the current-voltage characteristic of emission is expressed by $\log i = f(1/U_a)$. Such a characteristic, taken at room temperature, is shown in Fig. 1. The diagram of Fig. 2 shows the same but six straight lines obtained for different temperatures between 300 and 630°K. For higher temperatures, they are less inclined and lie higher. The nature of the temperature dependence of the autoelectronic current may be seen from Fig. 3; $\log i$ is plotted as a function of the reciprocal temperature for seventeen voltages between 2.4 and 4.0 kv. The curves have two linear sections of different slope; at low temperatures, the slope is smaller than at high temperatures. The higher the voltage, the less inclined is the slope of both sections; at $U_a \geq 3.8$ kv, no salient point occurs any longer, and the current is independent of temperature. Next, the authors attempt to explain these results on the basis of the theory of autoelectronic emission (Refs. 3-6). The temperature dependence of autoelectronic emission is a result of electron concentration in the layer of the semiconductor near its surface. The concentration is

Some Laws of Autoelectronic Emission From Semiconductors

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increased by a penetrating field. The drop of the potential energy of the electron and of the carrier concentration in the above-mentioned layer is calculated. Assuming that the surface states have only a slight effect, the experimental observations are in good agreement with theory. Numerical results are compiled in a table. There are 4 figures, 1 table, and 7 references: 6 Soviet and 1 British.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet Fizicheskiy fakul'tet (Leningrad State University, Department of Physics)

SUBMITTED: January 3, 1960

Card 3/3

26.1632
9,3120 (1003, 1137, 1140)

S/109/60/005/008/004/024
E140/E555

AUTHORS Shishkin, Yu. G. and Sokol'skaya, I. L.

TITLE Work Function of Au-Ba and Cu-Ba Systems

PERIODICAL Radiotekhnika i elektronika, 1960, Vol.5, No.8, pp.1218-1224

TEXT It was postulated in a previous work (Ref 5) that the effect of gold in reducing the thermionic emission of grids is due to the formation of a non-metallic Au-Ba compound. The present paper describes experimental tests of this theory. The work function of the system was investigated by the contact difference of potentials method. Vacuum of the order of 10^{-8} - 10^{-9} mm Hg was maintained. The stabilizing effects of gold were observed for film thicknesses down to 0.3 μ. The behaviour of Cu-Ba is similar, but continued deposition of barium leads to the formation of islands of pure barium with reduced work function. This is attributed to an insufficient rate of barium diffusion in the Cu-Ba lattice in comparison with Au-Ba and accounts for the inferiority of Cu in reducing grid emission. There are 6 figures, 1 table and 15 references: 9 Soviet and 6 non-Soviet.

SUBMITTED December 21, 1959

Card 1/1

S/109/60/005/008/019/024
E140/E355

26.2312
9.3120 (1003, 1137, 1140)

AUTHORS: Zubenko, Yu.V. and Sokol'skaya, I.L.

TITLE: Field Emission of Tungsten Carbide and Thoriated Tungsten Carbide

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol. 5, No. 8, pp. 1327 - 1337 + 2 plates

TEXT: Monocrystal tungsten point cathodes were heated in an atmosphere of diffusion oil vapour, changing into monocrystal tungsten carbide W_2C. The field emission patterns of these points and their dependence on potential and temperature were studied by recording the volt-ampere characteristics at vacuum 10^{-9} mm Hg; the emission patterns were observed during adsorption and evaporation of metallic thorium. The thorium increased the field emission on both tungsten and tungsten carbide. The rate of thorium evaporation from tungsten carbide is substantially less than from pure tungsten although the heats of evaporation are the same. The heat of evaporation obtained, 4 eV, is half the value obtained by a

Card 1/2

S/054/61/000/001/004/008
B117/B203

26.2421

AUTHORS: Sokol'skaya, I. L., Klimin, A. I.

TITLE: Autoelectronic emission from cadmium sulfide and selenide. I. Dependence on the electric field and on temperature

PERIODICAL: Vestnik Leningradskogo universiteta. Seriya fiziki i khimii, no. 1, 1961, 34-41

TEXT: The authors give a detailed report on a study of the dependence of an autoelectronic current from CdS and CdSe on the electric field, on temperature, and on exposure to light. Some special features of autoelectronic emission from CdS and CdSe have been described in a brief communication (Ref. 1: A. I. Klimin. ZhTF. 27, 4, 719, 1957). Autoelectronic emission was studied with devices of the spherical projector type. The emitter used was a 2-5 mm long CdS single-crystal grain (or a needle-shaped CdSe crystal) attached with an Aqua-dag drop to the molybdenum input or to a tungsten arc. Most devices were equipped with a willemite screen for observing micropictures. Some devices had no screen. This excluded an additional exposure to light of the photosensitive emitter

Autoelectronic emission from...

with the fluorescent screen. The CdS crystals studied had a resistivity of 10^7-10^8 ohm·cm. When exposed to white light of about 1000 lux, the conductivity increased by the 10-10^3 fold. Maximum photosensitiveness lies at 500 mμ. During exposure to infrared light, the photoconductivity was found to cease. A considerable inertia of the photocurrent was established. The properties of crystals remained unchanged in a vacuum of 10^{-7}-10^{-8} mm Hg. After several hours of heating to 450°-500°C, the photosensitiveness of crystals decreased with constant dark resistance. The emission picture was composed of individual emission spots. In freshly prepared emitters, the measurable current occurred at a voltage of 1-1.5 kv. In continuous operation of the emitters, the voltage increased up to 3-4 kv. The break in the CdS and CdSe current voltage characteristics observed in the range of 10^{-11}-10^{-13} a is ascribed by various authors to the action of surface states, or to a generation of charge carriers by means of a strong internal field in the emitter. The authors explain the occurrence of this break by the presence of several emitting peaks. This

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is revealed by the emission picture, and confirmed by the shape of the emitting crystal observed in the electron microscope. At low voltage, the main current is emitted from the thinnest peak. With an increase in voltage, the fraction of "thick" peaks in the emission becomes greater. This involves a quicker growth of the current, i.e., a break in the current voltage characteristic. In cases where the emission picture showed one spot only (emission from one peak), the characteristics were always linear in the respective range. A redistribution of voltage was found to take place between emitter and vacuum interspace. It is, however, not large enough to distort noticeably the qualitative course of the current voltage characteristic. When studying the temperature dependence of the electron current of CdS, a change in the emission picture was observed during the increase and decrease of temperature. The lower inclination of the straight line log $I = f(1/V)$ with increasing temperature is striking. This lower inclination of the current voltage characteristic during heating or exposure to light (increase of n_∞) may be explained by the dependence of ΔR on n_∞ (ΔR = decrease in potential energy of the electron on the semiconductor surface due to field penetration). The

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physical meaning of the function $\Delta R(F, n_\infty)$ lies in the fact that with higher concentration of the charge carriers the field penetrates less into the semiconductor, and has a lower effect on the concentration of free charge carriers on the surface. The experimental data found and their interpretation show that the investigation of the temperature dependence of autoelectronic emission from semiconductors can be used for a qualitative, and possibly also for a quantitative checking of the theory. There are 5 figures and 11 references: 7 Soviet-bloc and 4 non-Soviet-bloc.

Card 4/4

S/054/61/000/001/005/008
B117/B203

26.2421

AUTHORS: Sokol'skaya, I. L., Klimin, A. I.

TITLE: Autoelectronic emission from cadmium sulfide and selenide. II. Effect of exposure to light

PERIODICAL: Vestnik Leningradskogo universiteta. Seriya fiziki i khimii, no. 1, 1961, 42-50

TEXT: The authors studied the effect of exposure to light on the autoelectronic emission from cadmium sulfide and selenide. Electric bulbs of up to 100 w were used as light sources. The dependence of the current on the light intensity was recorded by means of neutral filters. The spectral distribution of the autoelectronic current was studied with the aid of an ИСП-73 (ISP-73) spectrosensitometer or a nomochromator with a glass lens system. Electric bulbs combined with special filters or a Globar were used as infrared radiation source. In some cases, projectors with weakly glowing tungsten wire were used. The relaxation of the autoelectronic current during exposure to light was studied within single light pulses. The ascending and descending curves of the emission current were recorded

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on photographic film by means of an МПО-2 (MPO-2) loop oscilloscope. The current voltage characteristics of CdS and CdSe crystals were recorded in the dark and in exposure to white light of ≈250 lux. A similar behavior was observed as in heating of the emitter; with increasing light exposure, the current voltage characteristic became less inclined. In the previous paper (Ref. 1: I. L. Sokol'skaya, A. I. Klimin. Vestnik LGU, no. 4, 1961), the authors qualitatively explained this behavior of current voltage characteristics of heated emitters on the basis of the autoelectronic emission theory of semiconductors. This explanation also holds for emitters exposed to light. A difference between the current voltage characteristics of heated and light-exposed emitters can only be found in a quantitative comparison with the theory. For a study of the illumination effect on the autoelectronic current with constant anodic voltage, it is more convenient to use the "photocorrection" to the autoelectronic current I_F. This is a correction for the illumination effect to the autoelectronic current, and represents the difference of autoelectronic current in exposure to light and in the dark. The authors studied the dependence of the "photocorrection" to the autoelectronic current on the light intensity, the spectral characteristics of photocorrection, the infrared extinction of

Autoelectronic emission from...

autoelectronic emission, the temperature dependence, and the inertia of photocorrection. The results obtained confirmed a direct relationship between the autoelectronic current and the carrier concentration in the conduction band of the semiconductor. This corresponds to the basic theses of the autoelectronic emission theory of semiconductors. The authors thank Yu. V. Zubenko for his assistance. There are 9 figures and 12 references: 4 Soviet-bloc and 8 non-Soviet-bloc.

Card 3/3

S/181/61/003/001/020/042
B006/B056

AUTHORS: Sokol'skaya, I. L. and Shcherbakov, G. P.

TITLE: Study of the effects of a strong field in autoelectron emitters-cadmium sulfide crystals

PERIODICAL: Fizika tverdogo tela, v. 3, no. 1, 1961, 167-175

TEXT: The authors set themselves the task of directly measuring the voltage drop occurring on a CdS emitter when taking off the autoemission current, in order to study the effect produced by voltage drop and carrier generation upon the autoelectron current. A study of the dependence of the voltage drop on the autoelectron-emission current flowing through the emitter under various conditions (temperature, exposure) permits not only a quantitative consideration of the effect produced by voltage redistribution upon the volt-ampère characteristics of the autoelectron current, but supplies also data concerning the effect of a strong field in CdS. The voltage drop on the emitter was determined from the delay-curve threshold of the autoelectron current from the emitter to the collector, i.e., from the positive potential on the collector (with respect to the emitter), at

which a current occurs in the collector circuit. The band scheme of the experiments is shown in Fig. 1, the circuit diagram in Fig. 2. The emitter was a 1-3 mm long CdS crystal having a cross section of 0.1·0.1 mm^2, which had been subjected to electron bombardment and strong current pulses before the measurements. Investigation of the dependence of the voltage drop ΔV_k on the emitter upon the autoelectron current i_a showed that in all cases ΔV_k increased monotonically with growing i_a. The temperature and exposure effects do not change the curves, but only their position; thus, the ΔV_k values are higher in darkness than when exposed to light, and they are higher in cold than in heat (measurements were carried out at room temperature and at the temperature of liquid nitrogen). The ΔV_k values were about 100-250 v; some high-ohmic CdS crystals attained 500-600 v in darkness and at room temperature, and at nitrogen temperature they attained 2000 v and more. Also the i_a dependence of the voltage drop between probe and the tip of the emitter showed the same (non-linear) shape. The voltage drop between probe and emitter base, hither, was found to increase linearly with i_a (at 300°K); at 93°K, also this curve had the usual non-linear shape (steep rise at small i_a values; quick flattening; at high i_a values, nearly linear course). At room temperature and in the dark, ΔV_k was also a linear

function of the anode voltage. Furthermore, also the heating of the emitter by the autoelectron current was investigated. Up to $i_a = 10^{-7}$a, the emitter practically was not heated at all, from 10^{-7} to 10^{-6}a a quick heating to ~150°C occurred, after which heating was slower up to 200°C and, finally, thermal equilibrium was established. An investigation of the effect produced by the voltage drop of the emitter upon the volt-ampère characteristics of the autoelectron current showed that the latter was only slight. The last part of the paper reports on the effect produced by a strong field in the emitter upon the volt-ampère characteristics in the case of exposures of varying strength. The volt-ampère characteristics are characterized by the following peculiarities: 1) all three have a break, whose position shifts with decreasing exposure toward lower current intensities; 2) with increasing exposure, the current intensity grows; 3) the exposure dependence of the current decreases at high voltages. M. I. Yelinson is mentioned. There are 10 figures and 9 references: 3 Soviet-bloc and 2 non-Soviet-bloc.

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S/181/61/003/001/020/042
B006/B056

Study of the effect of a strong...

ASSOCIATION: Fizicheskiy fakul'tet Leningradskogo gosudarstvennogo universiteta (Division of Physics, Leningrad State University)

SUBMITTED: May 31, 1961

Card 4/6

Study of the effects of a strong...

Legend to Fig. 1: Э - emitter; A - anode; K - collector; λ_k - work function of collector; $\lambda_э$ - work function of emitter; U - potential energy; ψ electron affinity of emitter; 1) metallic emitter; 2) semiconductor emitter without penetration of external field; 3) semiconductor emitter, into which external field penetrates, lowering the bottom of the conduction band by ΔR; 4) high-ohmic semiconductor emitter, in which the autoelectron current produces a voltage drop ΔV_k.

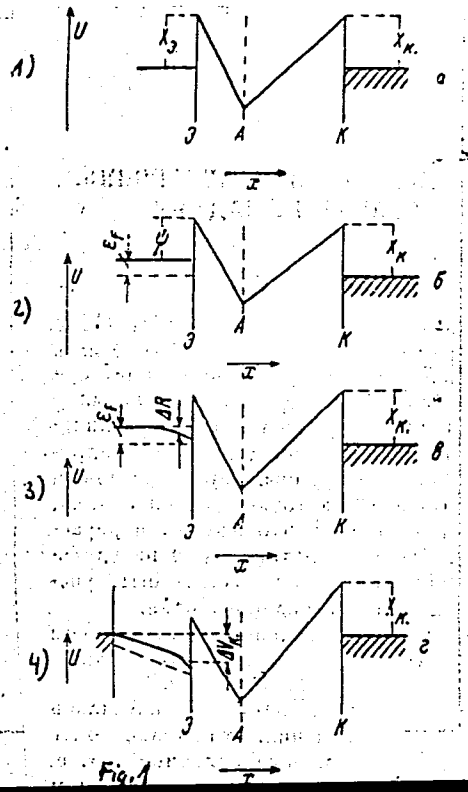

Fig. 1

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Study of the effects of a strong...

Legend to Fig. 2a: 1) CdS emitter; 2) anode; 3) anode attachment; 4) willemite layer; 5) protective cylinder; 6) collector;
Legend to Fig. 2b: 1) emitter; 2) probe.

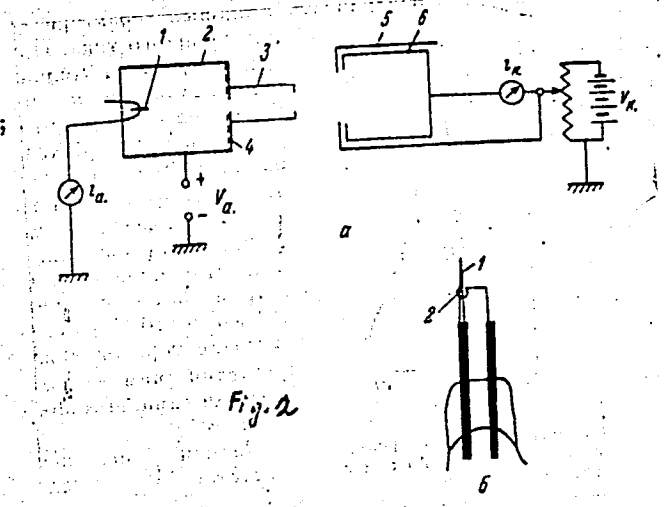

Fig. 2

Card 6/6

S/181/61/003/003/016/030
B102/B205

AUTHOR: Sokol'skaya, I. L.

TITLE: Adsorption, migration, and evaporation of cadmium on tungsten

PERIODICAL: Fizika tverdogo tela, v. 3, no. 3, 1961, 790-795

TEXT: A study has been made of the adsorption, migration, and evaporation of cadmium in an ordinary Müller electron projector. Numerous adsorption and emission pictures are shown and discussed. Adsorption: Cadmium sputtered upon hot tungsten points (~150°C) formed nearly a uniform coating owing to its surface migration. The dependence of the auto-electron current from the tungsten point on the time of Cd sputtering shows a curve that rises in the first 14 min and then slightly drops with a step at a time of about 8 min. This phenomenon is related to the quick occupation of the area not covered up to this time. The work function as depending on the sputtering time shows that the work function reaches a minimum (3.9 ev) after about 14 min. At this instant of time, the coating exhibits maximum emission. The work function for "thick" Cd layers (thicker than monatomic) amounted to 4.1 ± 0.1 ev, and the slope of the volt-ampere characteristic of the auto-

Adsorption, migration, ...

electron current yielded a value of 4.5 ev. Migration: It takes place at a measurable rate between 100 and 150°C; slow migration is observable already at 50°C. Evaporation: Evaporation takes place, above all, from the faces (134), (233), (112), and from the neighborhood of the (111) face. This is followed by a decrease in the emission from (111) and (233), and, finally, cadmium is left only in the vicinity of the (001) face. Fig. 5 illustrates the change in time of the auto-electron current during the evaporation of initially uniform coatings at 660 (1), 700 (2), 760 (3), 800 (4), and 830°K (5). The curves show that the rate of evaporation depends largely on the thickness of the coating. The energy of Cd evaporation was measured to be 1.5 ± 0.1 ev, and was independent of the thickness of the coating within the accuracy of measurement. The investigations were made with a device evacuated down to $2\text{-}3 \cdot 10^{-9}$ mm Hg and with a molybdenum getter and an Al'pert pressure gauge. The results of calculation of the interatomic distances in the various face planes are summarized in a table.
The author thanks Yu. V. Zubenko who assisted in the construction of the measuring device and in the elaboration of the method of temperature measurement. He also thanks G. Zhdanov and G. Reshet'ko, students of the Division of Physics of LGU, for several measurements. There are 6 figures,

Card 2/4

Adsorption, migration, ...

1 table, and 4 non-Soviet-bloc references. The reference to the English-language publication reads as follows: P. Anderson, Phys. Rev. 98, no. 6, 1955.

ASSOCIATION: Fizicheskiy fakul'tet Leningradskogo gosudarstvennogo universiteta (Division of Physics of Leningrad State University)

SUBMITTED: July 13, 1960

(1) Индексы граней	(2) Число ближайших соседей по [3]	по [4]	(3) Междуатомные расстояния в долях постоянной решетки (6)	в Å
(001)	4 1	4 1	a	3.16
(011)	3 1	2 2	$a\sqrt{3}/2$	2.73
(112)	3 2	3 3	$a\sqrt{3}/2$	2.73
(123)	4 1	5 3	$a\sqrt{3}/2$	2.73
(012)	4 1	4 2	$a\sqrt{3}/2$	2.73
(122)	3 3	4 3	$a\sqrt{2}$	4.35
(111)	— —	4 3	$a\sqrt{2}$	4.35
(013)	— —	— —	a	3.16

Legend to Table: 1) Face indices, 2) number of nearest neighbors, 3) interatomic distances, 4) according to Ref. 2, 5) according to Ref. 4, 6) in lattice-constant units.

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Adsorption, migration, ...

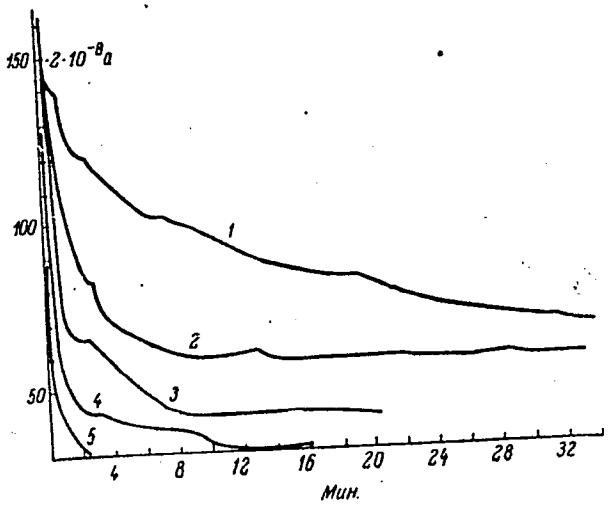

Fig. 6

Card 4/4

9,3120 (1003, 1138, 1331)

23125
S/181/61/003/005/030/042
B108/B209

26.2531

AUTHORS: Zubenko, Yu. V. and Sokol'skaya, I. L.

TITLE: Field and thermionic emission of thorium and barium layers upon tungsten

PERIODICAL: Fizika tverdogo tela, v. 3, no. 5, 1961, 1561-1565

TEXT: The authors studied the thermionic and field emission of tungsten as depending on the thickness of thorium and barium layers upon it. Earlier investigations showed that the work function of tungsten had a minimum when tungsten was covered by a monatomic layer of Th or Ba. However, measurements in a vacuum of $5 \cdot 10^{-9}$ mm Hg showed a monotonic rise in emission with growing thickness of the coating. The authors explain a possible emission maximum by the presence of oxygen which, in the case of insufficient vacuum, is adsorbed on the surface of tungsten. In order to prove their supposition, they measured the thermionic emission of thorium and the field emission of thorium and barium upon tungsten as depending on the thickness of the layer at a vacuum not higher than

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Field and thermionic emission of ...

$5 \cdot 10^{-9}$ mm Hg. The thermoemission was studied with the help of a diode with a 7 or 20 mm long anode opposite the middle of a 100 mm long and 0.112 mm thick tungsten wire. The thorium source consisted of a tantalum strip with a molybdenum foil welded on it, into which thorium powder was pressed. In the measurements, this thorium source had the potential of the cathode. Fig. 2 shows the thermionic emission of tungsten as depending on the thickness of the thorium layer, taken at a temperature of 1800°K. In the case of field emission which was measured under the same conditions as thermionic emission, it is more convenient to observe the decrease in anode voltage, required to maintain a constant autoelectronic emission, with growing thickness of the thorium or barium layers. Fig. 3 shows the result for a thorium layer at a current of 6 μa. The curves for barium are qualitatively the same. The work function of barium and thorium was determined to be 2.1 and 3.0 ev, respectively. A monotonic rise in emission with the thickness of the layer is characteristic of metal layers adsorbed on a metal; the occurrence of a maximum is related to the chemosorption of oxygen upon tungsten (Ref. 11: R. Gomer. Adv. in Catalysis, VII, 93, 1955; I. A. Becker. Adv. in Catalysis, VII, 135, 1955). There are 4 figures and

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23125
S/181/61/003/005/030/042
B108/B209

Field and thermionic emission of ...

13 references: 12 Soviet-bloc and 1 non-Soviet-bloc.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet imeni A. A. Zhdanova (Leningrad State University imeni A. A. Zhdanov)

SUBMITTED: November 29, 1960

Fig. 2. Legend: Abscissa: t (time of thorium evaporation in minutes; ordinate: log I (I - current in μa).

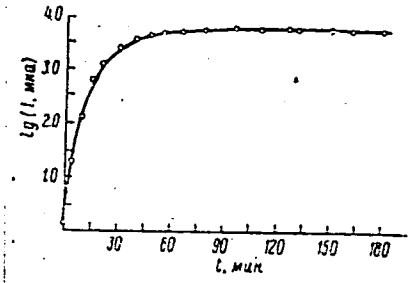

Fig. 2

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23125
S/181/61/003/005/030/042
B108/B209

Field and thermionic emission of ...

Fig. 3. Legend: Abscissa: t in minutes; ordinate: Voltage V in kv.

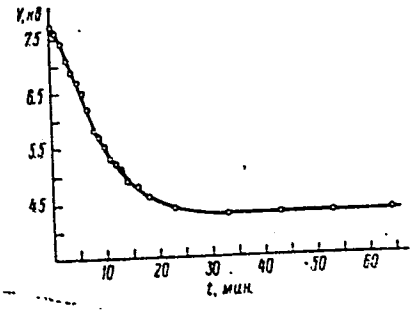

Fig. 3

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S/181/61/003/011/023/056
B125/B102

AUTHORS: Sokol'skaya, I. L., and Mileshkina, N. V.

TITLE: Autoelectronic emission from thin germanium layers upon tungsten

PERIODICAL: Fizika tverdogo tela, v. 3, no. 11, 1961, 3389 - 3394

TEXT: Earlier publications by K. B. Tolpygo (ZhTF, XIX, 1301, 1949) and by A. R. Shul'man and A. P. Rumyantsev (ZhTF, XXV, 1898, 1955) are quoted first. The authors studied the autoelectronic emission from germanium layers upon tungsten backings. The studies were made with an autoemission microscope (projector) at a residual-gas pressure of the order of 10^{-9} mm Hg. At constant operating conditions, the quantity of evaporated substance was proportional to the time of evaporation. When a small quantity of germanium is sputtered on a tungsten point at room temperature the emission pattern on the side of evaporator becomes considerably darker, owing to the germanium layer. When the specimen is slightly heated, the condensate will migrate in the form of a dark film

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S/181/61/003/011/023/056
B125/B102

Autoelectronic emission from ...

with a clear boundary, and will gradually cover the whole surface of the emitter. At a sublimation temperature of 400 - 500°K, complete covering takes 3 - 5 minutes. The thick layer appearing in the case of larger quantities of germanium is rather coarse-grained and displays an intense emission. The boundary of this thick layer shifts opposite the motion of the thin layer which appears in addition. A point evenly covered with a thin double layer can be obtained if evaporation technique and temperature of the point are properly chosen. Any local intensification of emission is due to a rise in field strength at the grains of the crystallites. The latter start forming at a temperature of the point of 800 - 900°K and evaporate at about 1400°K. The layer left back after this is very stable. The constant value of the autoelectronic current which decreases with time amounts to about 1/40 of the initial emission of pure tungsten. Fig. 4 shows the voltampere characteristics of the autoelectronic current. The thickness of the thin germanium layers prepared in this way is not yet known, but four facts which are more thoroughly discussed here are indicative of a monoatomic layer. The sharp boundary of the migrating film can be explained as follows: The

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Autoelectronic emission from ...

atoms of the first layer are strongly bound to the backing, but the atoms of the subsequent layers can easily migrate over the former and creep down to the backing as soon as they have reached the boundary. They are adsorbed on the backing so that the boundary of the layer is displaced. The energy pattern of the contact between the metal and the thin semiconducting layer in the presence of a strong field on the surface is illustrated by Fig. 5. Owing to the trifle thickness of the layer ($l \ll x_0$) neither the penetration of the external field nor the possible surface conditions have an influence upon the properties of the layer. The potential barrier of Fig. 5 may occur also when the work functions of the metal and of the semiconductor are incidentally equal. K. B. Tolpygo and P. P. Konorov, Yu. V. Zubenko and Kh. Noymann are thanked for discussions. There are 5 figures and 7 references: 5 Soviet and 2 non-Soviet. The two references to English-language publications read as follows: R. Gomer. Adv. in Catalysis, VII, 93, New York, 1955; J. A. Dillon a. H. E. Farnsworth. Journ. Appl. Phys., 28, 174, 1957.

Card 3/6 C/

S/181/61/003/011/023/056
B125/B102

Autoelectronic emission from ...

ASSOCIATION: Leningradskiy gosudarstvennyy universitet im. A. A. Zhdanova (Leningrad State University imeni A. A. Zhdanov)

SUBMITTED: June 13, 1961

Card 4/6

SOKOL'SKAYA, I.L.; KLIMIN, A.I.

Field emission of cadmium sulfide and cadmium selenide. Part 2: Effect of illumination. Vest. LGU 16 no.4:42-50 '61. (MIRA 14:3)

(Cadmium sulfide--Electric properties)
(Cadmium selenide--Electric properties)

33341
S/181/62/004/001/007/052
B102/B138

9,3120 (1003, 1138, 1160)
24,7700 (1035, 1043, 1385)

AUTHORS: Sokol'skaya, I. L., and Shcherbakov, G. P.

TITLE: Experimental verification of the cause of nonlinearity of the volt-ampère characteristics of autoelectronic current in CdS single crystals

PERIODICAL: Fizika tverdogo tela, v. 4, no. 1, 1962, 44 - 51

TEXT: A method described by the authors in an earlier paper (FTT, 3, 167, 1961) was used to demonstrate that the nonlinear increase in autoelectronic current observed with semiconductor emitters may be attributed to carrier multiplication. The volt-ampere characteristics can be divided into three sections: (1) strong fields, rapid increase of current, rate of increase inversely proportional to illumination intensity; (2) medium fields, straight sections, running in parallel for different illuminations; (3) weak fields, current drops with voltage, accelerating as illumination intensity increases. These three ranges were studied separately. In the first range it was found that the carrier concentration was independent of voltage up to ΔV_k = 160 v. Below this, Ohm's law was valid; above it,

Card (1/3)

Experimental verification of...

however, the carrier concentration rose according to the law $n = n_0 e^{\alpha(\Delta Vk-160)}$, $\alpha = 4 \cdot 10^{-3}\ v^{-1}$. Measurements of n/n_0 and i/i_0 in dependence on U_a (anodic voltage) confirmed the relation expected between field-induced carrier concentration and autoelectronic current, and showed that the nonlinear increase of the current is really due to this effect. In the range of medium fields the current was proportional to the illumination intensity L: $i_a = \text{const} \cdot L$ and to the carrier concentration n: $i_a = \text{const} \cdot n$. In the range of weak fields Ohm's law is also valid and $i_1/n_1 = i_2/n_2 = \ldots$ for the characteristics 1, 2, ...; a deviation from the straight course is, however, observed. This deviation is explained as follows: Transition from the weak to the medium field range (parallel characteristics) occurs at anodic voltages which increase with L. At low U_a the autoelectronic current is almost independent of L. These facts can be explained on the assumption that the additional growth of i_a in the weak-field range is due to an increase of electron energy under the action of inner fields. Since i_a is proportional to the electron concentration

Card 2/3

Experimental verification of...

near the surface, $n = n_\infty \left(\frac{C}{\sqrt{n_\infty}} + \sqrt{\frac{C^2}{n_\infty} + 1} \right)$ with $C = F/4e(2\pi\xi kT)^{1/2}$, n_∞ is the volume concentration, F is the external field strength and ξ is the dielectric constant. In weak fields and with low electron concentrations, the illumination-induced increase in concentration is compensated by a decrease in band inflection. With increasing internal field the electron gas is heated, no compensation occurs and the electrons can pass more easily through the barrier. Boadening of the distribution function reaches a limit at ΔV_k = 15 - 20 v, therefore at medium field strengths $i_a \sim n$. From ΔV_k = 150 - 200 v carriers are generated by the strong internal fields, n increases exponentially with ΔV_k and i_a increases with 1/U more rapidly than exponentially. There are 9 figures and 4 references: 2 Soviet and 2 non-Soviet. The reference to the English-language publication reads as follows: R. Stratton, Proc. Phys. Soc. B68, 746, 1955.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet (Leningrad State University)

SUBMITTED: July 6, 1961

Card 3/3

43126

S/181/62/004/011/026/049
B125/B186

AUTHORS: Novikov, B. V., Sokol'skaya, I. L., and Shcherbakov, G. P.

TITLE: Fine structure of spectral dependence of the autoelectronic emission from CdS monocrystals

PERIODICAL: Fizika tverdogo tela, v. 4, no. 11, 1962, 3240-3243

TEXT: The fine structure of the electron spectra were studied in order to elucidate structures which show analogies to the spectral distribution of photoconductivity, also to obtain new data on autoelectronic emission, and to compare the data with those of photoconductivity. In the experiments, a Müller-type electron generator with a vacuum of $\sim 10^{-9}$ mm Hg was used. CdS crystals, measuring 5·0.5·0.01 mm^3, were used as emitters with no special impurities introduced. To restore the photosensitivity of the crystals which was lost at 480°C in the degassing process they were bombarded with electrons of 1.5 kev. For working at low temperatures the thermal equilibrium of the crystal temperature was established at 83°K with the aid of liquid nitrogen. A monochromator with a dispersion of 45 Å/mm and a spectral slit of 2-8 Å was used to illuminate the entire crystal together

Card 1/4

Fine structure of spectral...

with the contact assembly. The autoelectronic emission was measured with an electrometric amplifier. The autoemissive current of the order of 10^{-12} to 10^{-8} a was recorded near the absorption edge at T = 83°K for two orientations of $\vec{E}$ with respect to the crystal's C-axis. These curves clearly revealed minima of autoelectronic emission which correspond to exciton absorption lines, but no maxima were observed. To eliminate possible experimental errors, CdS crystals were studied in five different apparatus. It is concluded that the character of the absorption lines is due to the specific nature of autoelectron emission or, more probably, to the electron bombardment and excessive heating in the vacuum. On the other hand, repeated bombardment did not change the positions of the exciton minima. Photoconductivity and autoelectronic emission spectra studied on the same CdS crystal revealed qualitative agreement but a very sharply expressed maximum of the photoconductivity current. Autoelectronic absorption maxima obtained under certain conditions at $\lambda > \lambda_{edge}$ where no exciton lines exist, and were completely or partially quenched by IR light. The appearance of long-wave maxima is attributed to illumination and plate voltage conditions. These phenomena are provisionally explained by the following hypothesis:

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the inhomogeneity of conductivity resulting from the strong field effect is experienced by the emitter point earlier than by the remainder of the crystal. Hence it generates a strong local field in certain parts of the crystal and consequently also a volume charge which is capable of oscillating. The electrooptical effect which may occur in the region of a strong field (L. V. Keldysh. ZhETF, 34, 1138, 1958) may possibly cause the excitation of electrons by light with $\lambda > \lambda_{edge}$. These electrons may diffuse into other parts of the crystal and may amplify the auto-electronic current. In this respect, the action of IR light is equal to that of visible light. The possibility of electrons being overheated in the strong field region and of non-equilibrium electrons diffusing into adjacent parts of the crystal is not excluded. There are 4 figures.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet (Leningrad State University)

SUBMITTED: June 26, 1962

43137

S/181/62/004/011/041/049
B108/B186

AUTHOR: Sokol'skaya, I. L.

TITLE: The thermionic emission from CdS single crystals

PERIODICAL: Fizika tverdogo tela, v. 4, no. 11, 1962, 3330-3332

TEXT: The thermionic current above room temperature was studied on CdS single crystals using an arrangement described by B. V. Novikov et al., FTT, v. 4, no. 11, 1962, 3240. Heating in dark caused the traps to decay, which became manifest in the vanishing of the thermionic current. The current reappeared only after illumination. Another CdS crystal of higher conductivity showed a maximum and thereafter an equilibrium dark current. To get information on the depth of the traps, the thermionic current under slow heating (0.33°C/sec) was recorded in the dark. Generally the equilibrium dark current increases with the temperature. A sharp maximum at 75°C was observed which corresponds to traps at a depth of 0.66 ev. There are 2 figures.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet (Leningrad State University)

SUBMITTED: July 6, 1962

Card 1/1